

Conference: Very Low Mass Stars and Brown Dwarfs

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Title: "Extremely Low Mass: The Circumstellar Envelope of a Potential Proto-Brown Dwarf"

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Abstract:

What is the environment for planet formation around extremely low mass stars? Is the environment around brown dwarfs and extremely low mass stars conducive and sufficiently massive for planet production? The determining conditions may be set very early in the process of the host object's formation.

IRAS 16253-2429, the source of the Wasp-Waist Nebula seen in Spitzer IRAC images, is an isolated, very low luminosity ("VeLLO") Class 0 protostar in the nearby rho Ophiuchi cloud. We present VLA ammonia mapping observations of the dense gas envelope feeding the central core accreting system. We find a flattened envelope perpendicular to the outflow axis, and gas cavities that appear to cradle the outflow lobes as though carved out by the flow and associated (apparently precessing) jet, indicating environmental disruption. Based on the NH₃ (1,1) and (2,2) emission distribution, we derive the mass, velocity fields and temperature distribution for the envelope. We discuss the combined evidence for this source to be one of the youngest and lowest mass sources in formation yet known, and discuss the ramifications for planet formation potential in this extremely low mass system.